GARDEN AND FOREST.

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The Boundaries of the New Parks.

THE attempt to secure a legislative enactment authorizing the Park Commissioners to sell such portions of the new park lands in the annexed district of this city as they might deem proper aroused such strenuous opposition that it seems to have been practically abandoned. The promoters of this scheme, however, have conceived another which is a trifle less audacious. They have revised the maps of the new parks to suit their purposes, and now ask the legislature to sanction these changes and to empower the Park Board to sell such lands outside of the new boundaries as the city has already acquired.

In examining the merits of this proposition it should be remembered that really we have no new parks. A park is an organized work; it is the expression of some design. The city possesses only certain pieces of ground which are to be used as the foundation of parks in the future. The boundaries of these lands were not fitted to any design whatever, but were laid down by a board of worthy citizens in accordance with their notions about the adjustment of conflicting interests and a vague idea that the city needed about so many acres. No doubt the particular shape of the territory was a matter of minor consequence to them, and they would probably mock at an expert who should assert that ten acres lying somewhere adjacent to the limits of their park land might be worth ten times as much as any other ten acres next to the boundary line, but on the inside. Of course no cursory examination by the best landscape-gardener in the world would enable him to say where the boundaries should be. No one could tell this unless he had the essentials of a design outlined in his mind, and a design implies serious study. No study by any competent expert has here been made. The boundaries have been determined altogether without relation to any plan, and of course, if any good plan is adopted they will need to be adjusted to suit it.

Here was the fundamental mistake. No one would attempt to construct a park without a design, and certainly the counsel of the designer could never be of greater value than in the selection of a site. When a site is chosen in a general way, it will be evident to a competent artist that it is adapted to some leading motive. In working out this motive, the prominent features of the scheme will enable its author to decide where the park should begin and end. In studying the plan of one of the new parks the maker will be certain to come to a point where a piece of land outside the given boundaries will be found essential to the consistency and unity of the design, and if this land cannot be secured, another motive must be adopted. Here runs a ridge, for example, and on its crest a road must be laid. It is plain that certain unsightly or incongruous city structures will grow up in full view from this pleasure drive, and they can be only shut out of sight by tree-plantations upon lands outside the present boundaries. After the land for Central Park had been purchased it was plain that more space was needed at Fifth and Eighth Avenues on Fifty-ninth Street to secure some dignity of approach and entrance. To complete the design in the artists' minds blocks were added also at the northern end of the park, and these additions were made at enormous expense. For similar reasons, and because the designers showed that the value of the Prospect Park site would be many times multiplied by the change, its boundaries were swung entirely out of their original position. The same thing will happen in the case of the new parks, unless the designing is entrusted to some journeyman, who will have no trouble to fit his kind of park into any given space. The journeyman's work does not grow out of an idea, but is run into a mould.

But because these boundaries will probably need modifying, it does not follow that their revision should be entrusted to a ward politician, or to his lawyer, or to a firm of brokers in neighboring real estate. To invite counsel from artists of this sort would be worse than the original folly of asking none. It is plain that the boundaries of the park lands should be left as they are until advice is had from some one competent to fit them to a consistent design, and competent to give intelligible and coherent reasons for the changes if any are required. A work of this magnitude demands creative talent of the highest order, and it should be entrusted to no other than a recognized master in his art. The completion of the parks is not a matter of immediate concern, although the city is sweeping towards them with ever-increasing speed, and the selection of a designer should not be long delayed. But until that selection, and the best possible selection, is made there can be no excuse for meddling with the park lands or their boundaries. Let them alone.

There has always been in this country an enormous waste of wood at the saw-mills in sawdust, slabs and other parts of logs too small or of too poor quality for use as lumber. The value of this refuse, could a market have been found for it, would easily have amounted during many years to millions of dollars every year. Its disposition has always been a serious labor and expense to manufacturers. For many years the sawdust was poured from the mills directly into the streams. But this practice assumed such vast proportions in some parts of the country that the streams became entirely choked up and so injured that both the general Government and some of the States were obliged to pass laws to protect rivers from this debasement. The burning up of all the waste from a large mill, amounting perhaps to seventy-five or a hundred cords a day, is difficult and expensive; it necessitates the use of an expensive furnace and a large force of men and teams; but the greater demand for wood-pulp and the improved methods of preparing it recently introduced are gradually turning what was once pure waste into a valuable product. The use of soda, applied in the wood "digester" simultaneously from above and from below, is changing methods of pulp manufacture; and the time perhaps is not remote when the great fires which burn day and night for months at a time, wherever lumber is manufactured on a large scale, will go out, never to be relighted.

A recent number of the *Saturday Review* devotes a page to "Forestry." No special familiarity with the subject is displayed by the writer, and the article contains nothing new and little worth quoting except these sentences:

"In a lifetime a man may find out a tree or two, grand and handsome in their maturity, which flourish on his land. But he plants many, exceedingly pretty and promising when young, which, as they advance in years, show that they languish in a foreign country, and present miserable contrasts to the splendid parent trees from which the traveler has brought the seed. In ornamental planting, except where a mass of thick covert is required for the picturesque, a tree should have plenty of room to display its proportions and full growth."

This can hardly be called forestry, but it is sound doctrine, and it can hardly be repeated too often for the benefit of those who are tempted to plant foreign trees, or to plant any trees without giving them ample space to spread out into strong and characteristic growth.

We have received the following notice from the Corresponding Secretary of the American Forestry Congress:

"The next meeting of the American Forestry Congress will be held in Philadelphia, on the 16th, 17th and 18th of October, 1889. Papers to be read at the meeting should be sent to the Corresponding Secretary before October 1st. I shall be glad to receive, from any source, short and vital papers on any of the practical aspects of forestry, and of tree-culture and preservation in this country. It is desirable to avoid long historical dissertations, and reviews of the general subject of forestry, as they benumb the faculties of the hearers, and lead to no valuable result. We wish to show that we have passed beyond this stage of the forestry movement. Some of the subjects to be discussed, and the arrangements of the local committees, will be announced hereafter. If the press of the country will kindly publish this notice I shall be grateful for their courtesy and cooperation. Every facility will be afforded for reporting the proceedings.

Franklin Falls, N. H. *J. B. Harrison.*

Gardening in Florida.

ONE who visits Florida for the first time is impressed most of all with the fact that the land is so largely wild and unsubdued. Outside of a few old settlements, pioneers are everywhere attacking the original forest, and the inhabitants are brought into as close contact with primeval nature as are those on our western frontier. Life in Florida, however, is not pioneer life as known in the West. Hotels, with every modern urban appointment, are to be found in the most untamed sections of the state, and evidences of luxury are seen in clearings where the stumps are still standing. But well-kept gardens are not noticed among other marks of refinement. This does not imply a lack of taste or of inclination to the art, for elaborate gardens cannot reasonably be looked for in a country comparatively new. The whole aspect of nature must be softened and mellowed by years of human control before fair gardens are developed naturally and harmoniously out of their surroundings.

It is not to be inferred from this that Florida has no ornamental planting to show. On the contrary, examples are seen everywhere, and they are full of promise. Great numbers of the shrubs and vines that are the ornaments of northern green-houses are here in full flower in February and March, to the constant surprise of tourists from colder latitudes. The great vine of *Bignonia venusta*, with its mass of orange-colored flowers, which covers the side of a house in St. Augustine, and the sheet of snowy bloom from a plant of *Solanum jasminoides*, stretching across the front of the piazza of the Putnam House in Palatka, will not be forgotten by anyone who has seen them. Specimens of Laurestinus, Chinese Hibiscus, Oleander, Allemanda, Poinsettia, Fragrant Olive, Rhincospermum and other flowering shrubs, trees and vines, which are seen everywhere, together with stately Bamboos and such collections of Palms as have been gathered by Mr. E. S. Hart at Federal Point, all prove that in years to come central and southern Florida will have gardens wherein will be displayed whatever is beautiful and luxuriant in the semi-tropical vegetation of the world.

Our purpose, however, is not so much to speak of the future of gardening in Florida as to call attention to some of the possibilities of genuine landscape work with the abundant indigenous growth of the state itself. The grandeur of mountain scenery is lacking, but the dense forests on rolling lands, the numerous lakes and rivers, the abundant broad-leaved evergreen trees, the Palmettos, which are characterized by a grace and stateliness rarely equaled, furnish material which can be combined in pictures of infinite variety and interest.

The home of Mr. A. H. Curtiss, at Talleyrand, on the bank of the St. John's River, a few miles from Jacksonville, well illustrates what can be accomplished by a careful study of the natural features of the region in the way of bringing out the beauty that was waiting to be revealed. About the house are disposed many rare and beautiful plants, but they add little to the general effect produced by the broader treatment of the grounds. Back from the river bank, which is covered with low trees and shrubs, among which Honeysuckle and Smilax clamber, with yellow Jessamine rioting over all, is an open space, and beyond this is the Orange-grove, which forms a feature of the grounds of every home in Florida—and a grove of healthy Orange-trees, with glossy foliage and golden fruit, is a spectacle of which the eye never tires. Behind this is a heavy forest of Live Oak, Water Oak, Hickory, Magnolia and Red Bay. The rich undergrowth of small trees and shrubs—Holly, *Andromeda feruginea*, Sweet-leaf, Vacciniums and a score of other shrubs, with inter-twining vines and a more modest growth of Scrub Palmetto, Partridge-Berry, Ferns and other lowly plants upon the forest-floor are all allowed to remain and encouraged to grow. Winding roads are cut through the woods, opening here and there, to give glimpses of the Orange-grove framed in with moss-draped branches of the Oaks, or of the broad river with the thickly-wooded banks beyond, or of some striking object like a great Magnolia, which is remarkable for its size and for that dignified expression that only comes to these trees with great age.

There is little more to be said; for it would be impossible, even if it were not outside of our present purpose, to give any adequate idea of the beauty of these distant pictures, or any satisfying description of the fine native trees in the forest or standing in loose groups about it. The lesson to be enforced is that whether in the low levels of the South, or on the rocky coast of New England, or in a glen among the Alleghanies, the aim should not be to transform home-grounds into something foreign or fanciful, but to unfold and enhance the native and peculiar beauty of the spot; to develop its own beauty rather than to decorate it with imported ornament. This is not an easy achievement, it is true. It implies an artist's sense, and it means an ability to treat nature with respect, if not with reverence. Surely one who agreeably leads you to a point where you unconsciously pause before a well-composed picture from which all incongruities are shut out by a frame of foliage, is accomplishing what the landscape-gardener aims at in his best constructive efforts. Many who attempt this kind of work in Florida or elsewhere will fail of very high attainment; but they will not be in such danger of displaying impertinence and pretentiousness as will those who endeavor to obliterate from their land everything that is distinctive, and rid it of everything common, so that they can trick it out in exotic finery of their own choosing.

The Art of Gardening.—An Historical Sketch.—III.
Egypt and Mesopotamia.

AFTER the isolation in which the Egyptians lived during the earlier centuries of their civilization had been broken through—after their kings entered upon that long series of foreign conquests which the monuments so lavishly celebrate—exotic plants were cultivated as well as those native to the valley of the Nile. The Rose, for example, was not a native of Egypt, nor can we guess at the date of its introduction, yet in later years it was very largely exported to Rome. The sacred Lotus itself was probably an exotic; and on certain bas-reliefs we see large trees in pots which are being transported by water, thus illustrating the statement that the triumphant armies of Egypt brought home from other lands such plants as struck their fancy, and placed them as trophies in front of palace or temple.

Flowers and ornamental plants were used in profusion, not only to enliven the Egyptian garden, but to perfume and adorn the apartment. The Rose was doubtless a prime favorite, but no plants were so beloved as the Lotus (see page 172) and the Papyrus. These grew in masses in the Nile, and were cultivated in every canal and basin. And the degee to which they were employed in sacred ceremonials is proved by the direct influence they had upon architectural development. We are all familiar with those Egyptian capitals which simulate an open Lotus-flower or a closed bud, and with the reeded shafts which show so strong a likeness to bundles of Papyrus

stems. But neither of these forms is found in the earliest monuments, nor would they readily occur to an architect under ordinary conditions. Their existence is best explained by the belief that the plain shafts and rectangular capitals originally employed were decorated for festivals with sheaths of reeds and wreaths of blossoms, and that the charming effects thus produced were afterwards translated into stone.* Thus gardening paid back to architecture a portion of the debt it owed for its own development. It is hardly needful to refer to the frequency with which Lotus blossoms appear in Egyptian picture records, held in the hands of priest and king during the performance of the most sacred rites. There is abundant testimony—graven, painted and written—to prove that flowers, and especially the Lotus, were thought essential to every act which the Egyptian performed in life, and followed him even into the grave. Only a few months ago withered garlands of Roses were unearthed from certain tombs in Lower Egypt—tombs which date, indeed, from perhaps the third century after Christ, but nevertheless embody the traditional customs of a far earlier time.

When we pass from the gardens of Egypt to those of Babylonia and Assyria, historical evidence is not so rich, but still convinces us that formal arrangements prevailed. There was as much reason here as we found in Egypt why picturesque and varied effects should not have been desired, and why gardening should have been the handmaid of architecture. Here again was an immense, flat, featureless country, peopled by a race of mighty builders.

Nothing that existed in all antiquity was more famous than the "hanging gardens" of Babylon. They are as well-known by name as the Pyramids of Egypt, and, like the pyramids, were counted among the Seven Wonders of the World. Yet not a trace of them remains on the site of Babylon, unless it be in certain foundation walls which have been assumed to belong to them; and from the historian's page we can scarcely gather much accurate knowledge. They were designed in harmony with the design of the Chaldæan temple—in the form of a great square, artificial mound, the several stages of which, rising one above the other, rapidly decreased in size, leaving wide terraces on all four sides. Strabo thus describes them: "The shape . . . is a square, and each side of it measures four plethra. It consists of vaulted terraces raised one above another, and resting upon cube-shaped pillars. These are hollow and filled with earth to allow trees of the largest size to be planted. The pillars, the vaults and the terraces are constructed of baked brick and asphalt. The ascent to each story is by stairs." Modern artists, relying on this passage, have often pictured the terraces as flanked by rows of great stone columns, and their fantasies have been reproduced even in serious histories of gardening, whose authors, while diligently consulting all records which deal professedly with this art, do not seem to have thought it needful to study architectural evidence with regard to architectural facts. Columns were not used in Babylonia, where no building stone existed,† and were rarely employed even in Assyria, as, though stone could readily here be obtained, the Assyrians clung to the precedents of Babylonia whence their civilization had been derived. "Many stately rooms of all kinds," says Diodorus, whom other writers confirm, were constructed along the sides of the terraces; but we must believe that their arched roofs were supported by solid piers, not columns. Or, as the picture-reliefs show a frequent use of slender shafts, constructed of metal or of wood sheathed with metal, to support the walls or porticos of small pavilions or kiosks, the apartments may have been flanked by projecting pavilions thus sustained. The surface of each terrace was covered with a coat of bitumen to prevent the percolation of water into its mass of sun-dried brick; and upon this was laid a stratum of earth thick enough to nourish flowers, shrubs, and even large trees, among which the Cypress and the Palm were doubtless most conspicuous. Strabo says that at the sides of the stairs were "water engines by means of which, persons, appointed expressly for the purpose, are continually employed in raising water from the Euphrates into the garden; for the river . . . flows through the middle of the city and the garden is on the side of the river." And Diodorus says that one of the apartments "had in it certain engines whereby it drew plenty of water out of the river through certain conduits and conveyances from the platform of the garden, and nobody without was the wiser or knew what was done." Nevertheless, we cannot fancy any extensive hydraulic machinery. No trace of preparation for such machinery—no tanks, canals or conduits—have been found in the great artificial mounds which supported the palaces of Assyrian kings. The most recent historians believe that their enormous water-supply must have been carried up from the adjacent Tigris by endless files of human beings; and thus, too, the hanging gardens of Babylon must have been watered; or, at the most, such simple hand machines and wheels as are still used on the banks of the Nile may have served to pass the buckets up from one terrace to another. Direct architectural evidence apart, it seems unlikely that large tanks and conduits could have been constructed in a land where unburnt brick was the main building material and stone was used merely to face the lower portions of interior walls.

The walls of the terraces were twenty-two feet in thickness, and tradition has given them an enormous area. But if we accept even the widest measurements of ancient writers (who were more prone to exaggeration than to understatement) we can compute them to have covered a space not much exceeding three acres; and even if this denotes the size, not of the lowest but of the uppermost terrace, it does not mean a very large garden, according to modern ideas. Yet when we consider the wholly artificial and very singular method of their construction, and the surprise a traveler must have felt to find a garden of any size flourishing under such difficult conditions, we can easily see how the hanging gardens won their exceptional fame.

The history of Mesopotamia falls into three great periods—those of the early Chaldæan or Babylonian dominion, of the Assyrian or Ninevite empire, and of the second Chaldæan empire, when Babylon more than renewed its ancient power and splendor. The hanging gardens of Babylon were associated in all classic times with the name of the fabled Semiramis, and their origin was sometimes carried as far back as the year B. C. 2000, into the period of the first Chaldæan empire. But even Diodorus saw the folly of this idea and attributed them to the second period of Babylon's glory. A plausible supposition is that they were built by Nebuchadnezzar, the mightiest monarch of this second period, who left his capital the most splendid city in the world, to console his wife, a Median princess, for the loss she suffered when she left the mountains of her native land for the level plains of Mesopotamia. But, in truth, nothing is known of their origin or its date. They were still flourishing in the time of Alexander, but perished, we can imagine, when ruin overtook the town, even more quickly than its other vast monuments, constructed like themselves of thick cores of crude brick, only slightly protected from drenching rains and scorching suns by a facing of kiln-dried brick or of stone.

New York. *M. G. van Rensselaer.*

*See Perrot and Chipiez, *History of Ancient Egyptian Art.*

†See Perrot and Chipiez, *History of Art in Chaldæa and Assyria.*

Foreign Correspondence.

London Letter.

THE meeting of the Royal Horticultural Society on March 12th was of exceptional interest, because of Mr. J. Gilbert Baker's lecture on the Saxifrages. That the addresses by specialists, which form part of the Society's programme for the year, are likely to promote the welfare of the Society, as well as of horticulture itself, was plainly indicated by the number of fellows and visitors who assembled to hear Mr. Baker's lecture. Saxifrages do not appeal with much force to the popular gardening spirit, although both Mr. Baker and his scientific view of the genus and Mr. George Paul in his instructive practical paper on the cultivated Saxifrages made it abundantly clear that the genus is eminently worthy of general cultivation. The geographical distribution of the 180 species recognized by botanists, the diversity of character in habit, foliage and flower, the beauty of the flowers of many of the species, and the comparatively few hybrids known, were the principal points dealt with by Mr. Baker. About ninety species are in cultivation, the best of which belong to the section Kabschia of Engler, and of which *S. Burseriana, S. media, S. marginata, S. cæsia* and *S. Tombeanensis* are examples. In the group called Porphyron we have the pretty *S. oppositifolia, S. retusa* and *S. Pyrenaica.* These are all cushion-like in habit and bear numerous large Primula-like flowers. *S. pyramidalis* and *S. longifolia* are the best of another group, which is characterized by rosettes of longish foliage and tall, graceful, pyramidal racemes of beautiful white flowers. *S. pyramidalis* is one of the most beautiful of all plants for the rockery, and even when grown in pots for the green-house it has few rivals. Mr. Paul's paper was devoted chiefly to showing how easily Saxifrages, as a rule, may be cultivated in an ordinary garden. Both these papers, as well as two others by specialists on the cultivation of Saxifrages, will be published in full in the resuscitated journal of the Society, the first number of which was

issued on Tuesday last. The revival of the Journal is a most commendable step, and cannot fail to do the Society good.

There was a fair number of interesting plants exhibited as well as some excellent groups of cut flowers, the Daffodils being the great attraction. A superb strain of Persian Cyclamens was sent by the St. George's Nursery Company, Hanwell, the flowers being remarkable for their large size and their purity and wide range of color. Market growers in the neighborhood of London are wonderfully successful with Cyclamens, and in the last ten years the improvement made in the form, size and color of the flowers has been considerable. *Clivia* (*Imantophyllum*) *miniata*, var. Lady Wolverton had the honor of receiving the first certificate awarded by the Society for a seedling Clivia. It is by far the handsomest Clivia I have ever seen, not forgetting the many fine varieties shown at the great Ghent Exhibition in April last. It bore three enormous heads of large, full, well-formed flowers, the segments overlapping and spreading so as to form a perfect limb, such as florists delight to see. The color was bright orange-scarlet, yellow in the throat. In Belgium and in France the Clivias, and particularly *C. miniata*, have been favorite garden plants for many years. The latter species was introduced from Natal by Backhouse, of York, in 1854. In 1877 Van Houtte distributed a hybrid raised from *C. miniata* and *C. nobilis*, which was named *C. cystanthiflora*. It blooms at Kew every spring, but it is not much better than the last-named parent as a garden plant. All the best Clivias are seedling forms of *C. miniata*. They are fast coming into favor in England on account of the time they flower (February to April), the length of time the flowers last and the bright colors of some of the forms. Amongst the best are Ambroise Verschaffelt, Marie Reimers, Van Houtte, Baroness Schrœder, Sovenir de F. Vervæne, Madame Lemonier, Joseph Spae and Madame Donner. They grow and flower best when treated as intermediate plants.

Other plants were Amaryllis, John Ruskin, a new Veitchian seedling with broad, rounded petals, the flower very large and crimson in color; *Iris Rosenbachiana* of the Persica group, dwarf, with mauve standards and stigmas, the falls orange and purple, said to be quite hardy, having been tested by Barr & Sons, Covent Garden, who exhibited several plants in flower; *Primula petiolaris*, a pretty little Alpine species, with a tuft of Auricula-like leaves and a cluster of short stalked, large, pale violet flowers—a new introduction, and, if easily cultivated, likely to become popular with all who admire Alpine plants. *Mutisia clematitis*, a most delightful climbing composite, with the leaves of a Vetch and large pendant flowers, in which the thick-spreading scarlet ray florets are like those of a single Dahlia, the disc florets being almost entirely hidden in the long urceolate involucre. To botanists this last was much the most interesting, Mutisia being the only genus of *Compositæ* in which the leaves bear tendrils. Horticulturists know the difficulties of successfully growing Mutisias in England. *M. decurrens* is one of the most beautiful of all hardy plants; so, too, is *M. ilicifolia* and *M. grandiflora*. Probably you know more about these plants than we do. In a few gardens one or other of those named are a success for a time, but they perish suddenly, just when one begins to feel that he has established them. If Mutisias are in American gardens, all lovers of hardy plants in England would be thankful for information concerning them.

Cypripedium Rothschildianum was exhibited in flower. It is a magnificent plant. The dorsal sepal two by two and a half inches, buff-colored, with deep crimson lines, the lower sepals smaller, but similar in color; the petals are six inches long, and half an inch broad at the base, from which they are gradually narrowed to a deflexed point, their color being buff, with crimson longitudinal lines and basal spots; the pouch is like that of *C. Stonei*, but vinous purple in color; and the curved, beak-like rostillum is most remarkable. The plant is as robust in growth as *C. Stonei*, and the scape is erect, stout, a foot long, with two flowers.

By its side was a plant, also in flower, called *C. Elliottianum*, but I have good grounds for suspecting that some mistake has been made in regard to the plants introduced and sold under this name. There can be no mistake about the type plant which was described by Professor Reichenbach and figured by Mr. Moon, a thoroughly trustworthy artist, who has drawn hundreds of Cypripediums, and who told me that *C. Elliottianum* was, in his opinion, the most beautiful of all. The type had white sepals with dark red lines, drooping petals, white, with purple stripes and freckles, and a brown-red pouch. But the plant shown under this name was simply a diminutive pale-colored form of *C. Rothschildianum*. The probability is that two distinct species have been collected and sold under one name. A splendid example of *Dendrobium nobile*, var. *Wallichianum*, was exhibited as a proof of the wisdom of pruning, so far as regards the cultivation of this species and its nearest allies. The specimen was four feet in diameter, and bore about eighty flowering pseudo-bulbs, each over two feet in height and bearing numerous fascicles of flowers. There must have been at least a thousand fully-opened blooms upon it. All the pseudo-bulbs, save those in flower, had been removed, and the grower stated that these will be cut away as soon as the new growths push new roots. A hybrid Cymbidium from the Messrs. Veitch combined the characters of its parents, *C. eburneum* and *C. Lowianum*, but was inferior to both; the sepals and petals are pale buff, the lip creamy white, with a rone of dull crimson and a white margin.

Dendrobium Schneiderianum, a Veitchian hybrid obtained from *D. aureum* and *D. Findlayanum*, was shown in flower. It is dwarf in habit, the flowers are in fascicles of about three, and are somewhat nodding; they measure nearly three inches across, and are ivory-white, with pink tips to the sepals and petals, the lip having a yellow throat and a blotch of purple in front.

The last of the Chrysanthemums appeared under the name of Mrs. J. N. Gerard, and was labelled as of American origin. The flowers were of the flat Japanese type, six inches across, lilac-purple, with pale tips, and chiefly remarkable for their lateness.

Kew, March 16th. *W. Watson.*

The Oriental Nelumbium Naturalized in America.

IN the early days of my enthusiasm for aquatic plants I read an item in a foreign horticultural journal stating that *Nelumbium speciosum* had been successfully grown in the open air and had withstood the winter unharmed in the "Jardin des Plantes" at Paris. In January, 1876, while in that city, I made a search to ascertain the truth of the statement, and found an artificial basin five or six feet in diameter in which were standing the dead flower-stalks and decaying foliage of the Nelumbium. There was one inch of ice upon the water of the pool at the time, and it was but natural to infer that the plant would prove hardy where lower temperatures prevail in winter than at Paris. During the next few years I cultivated the Nelumbium successfully in my garden here and proved its hardiness when its tubers are not exposed to actual freezing. I found that a temperature causing the formation of ten inches or more of ice on the water above the dormant tubers was no obstacle to successful cultivation. Having seen large ponds filled with masses of our native species (*N. luteum*) a desire arose to see how this foreign floral treasure would behave under like conditions.

Two miles from my present home is an artificial pond, a secluded corner of which was selected for the experiment. Many years ago this spot was rich meadow-land, where farmers were accustomed to cut hay. The soil is a dark, greasy clay, and, since the formation of the pond, has been made richer still in vegetable matter by the deposit of sediment in time of freshets by the wash from adjoining hills. *Nuphar advena* was the principal aquatic plant growing there. By the courtesy of the farmer who owns the property the experiment was made, and about nine years ago a single plant of *N. speciosum* was placed in the centre of the little cove where the water is from one to two feet deep. It soon became established and began to spread in all directions, blooming profusely each year. One summer it was nearly destroyed by cattle from an adjoining pasture. They found the foliage a sweet morsel, waded in, and ate it all down.

In a year or two the plants recovered and went on making their marvelous growth, and during the past summer and autumn they showed a solid mass of magnificent foliage and bloom, covering three-quarters of an acre. Last August, at the height of the blooming period, about 500 of the beautifully-shaded pink flowers were open at once. In their last stages of expansion they measure from ten to thirteen inches in diameter. They stand from three to six feet above the water, and in some instances, flower-stalks pulled from their base in the mud, measure eight feet in length. Multitudes of leaves are found twenty-four to thirty inches across, and one season I found a leaf which measured thirty-six inches in diameter. The tallest man is hidden from view when walking through the mass of foliage. Not content with remaining in the water, an occasional plant will creep a few feet out into the thicket of Alders and wild Roses on the bank, apparently satisfied with a moist soil without water on the surface. When the frosts of October arrived a few buds were caught still unexpanded.

Such a tropical aspect does this plant here present that one would scarcely be surprised to see Palms and Bamboos growing upon the shores of the pond. Could similar pictures be reproduced in the parks of our large cities they could not fail to attract the admiring attention of thousands of people.

I believe that the day is not far distant when this so-called "Sacred Lotus" and its beautiful varieties will be as universally cultivated and as popular in America as they now are in some eastern countries. I may here mention one of its habits which would seem to furnish an example of "vegetable intelligence." During the summer the slender rhizomatic stems spread horizontally in every direction, but at only a moderate depth in the soil. Upon the approach of autumn the growing points of these rhizomes descend to a much greater depth (sometimes eighteen inches), and there the tubers are formed which lie dormant until late in spring, when an increase of temperature induces a new growth. This new growth immediately re-ascends to the normal level, and the process of horizontal growth is repeated. Is this not a design to preserve the tubers from freezing and the depredations of animals? The accompanying illustration was made from a photograph taken in August, 1888, and does not show the entire plantation.

Bordentown, N. J. *E. D. Sturtevant.*

The Sacred Lotus in New Jersey.

[We have more than once alluded to the great service rendered to American horticulture by Mr. Sturtevant in popularizing the cultivation of the finest aquatic plants in this country. A still greater service is his demonstration of the fact that the beautiful "Sacred Lotus" can be naturalized here. Its hardiness having been demonstrated, there is now no reason why this Lotus cannot be made to cover shallow ponds from Cape Cod through all the coast-region of the middle and southern states; or why this beautiful plant may not become as conspicuous a feature in American life and art as it is in those of Japan, where, although doubtless introduced from continental Asia, it is as widely spread as any indigenous plant. If the Bordentown experiment proves to be the precursor of many thousand more, as it is sincerely to be hoped that it may, Mr. Sturtevant's name will deserve to live among those of men who have made valuable contributions to American civilization.

As far back as written history or the picture-records of ancient peoples reach, the "Sacred Lotus" may be found; and no other plant has played so prominent a part in the ceremonies of royal life, in the rites of religion, or in the development of art.

Many kinds of Water-lilies were familiar to the ancient Egyptians, and the name Lotus seems to have been given to them all. Among them were Nymphæas analogous to our common white and yellow Water lilies, and also a species with blue flowers (*N. cærulea* or *stellata*), and another which was either red or white with red-streaked sepals (*N. Lotus*). But the true Egyptian Lotus, the "Sacred Lotus" of the whole East, is the plant with rosy flowers which Linnæus called *Nymphæa nelumbo*, but modern botanists have placed in another genus and called *Nelumbium speciosum*. This no longer grows wild in the Nile, and, perhaps, was not a native of Egypt. It appears in very early pictures produced at a time when Egypt was practically shut off from the rest of the world; and if it was, indeed, an exotic, must have been introduced in those primitive days when this part of the world was being peopled, or re-peopled, by tribal immigrations from the East. But there is nothing improbable in such a supposition. Tree-worship was one of the very earliest forms of religion, and where trees were adored certain flowers may well have been held sacred and have been transported from place to place, together with such herbs and roots as had proved themselves possessed of healing properties. The Lotus seems to have been revered in India as well as in Egypt from the dawn of history; and it is not impossible that it traveled from the former country—where we know it is indigenous—to the banks of the Nile at a time so remote that even Egyptians of the earliest historic dynasties may have believed in its local origin.

The difference in habit between this plant and the Nymphæas will readily be appreciated from our illustration. "It is at least one-third larger," says an observer who has

studied it in Egypt,* "than our common Water-lily, from which it differs also in the behavior of the leaves and of the stems which bear the flowers. These do not float on the surface of the water, but rise above it to a height of from twelve to fifteen inches. The flower, which stands higher than the leaves, is borne upon a stalk which, instead of being soft and pliant like that of the Water-lily, has the firmness and consistency of wood. It has an agreeable smell like that of Anise. In the bas-reliefs the Egyptians are often seen holding it to their nostrils. The fruit, which is shaped like the rose of a watering-pot, contains seeds as large as the stone of an Olive. These seeds, which were eaten green or dried, were called 'Egyptian Beans' by the Greek and Latin writers because they were consumed in such vast quantities in the Nile valley. . . . Even the root was not wasted; according to the old historians it had a sweet and agreeable taste."

Herodotus compares the seeds of the Nymphæas to those of the Poppy. They, too, were eaten, being pounded in a mortar and made into a kind of bread. But neither of these plants should be confounded with the Lotus which formed the food of the so-called *Lotophagi*, in Ethiopia, and has been so widely celebrated for its Lethe-like effects by ancient and modern poets. This was the "Lotus-tree," which Pliny says some persons identified with the Celtis, but which modern commentators believe to have been the *Rhamnus Lotus* of Linnæus, the *Zizyphus Lotus* of more recent botanists.†

The extensive thickets which the Lotus formed along the banks of the Nile are frequently pictured on Egyptian monuments, with men in boats hunting aquatic birds and animals among their crowded stems; and ancient writers tell us that popular festivals were held among these green and rosy water-groves. Constantly when sacred ceremonies are portrayed, Lotus-flowers are held in the hand of the chief figures. They were the symbols of generation, life, resurrection and immortality, and therefore consecrated to Osiris. The four genii of the future world are sometimes depicted standing upon them, and they likewise form a seat for the infant Horus, while historians tell us that they were appropriately presented to the guests at funerals.

In Assyrian and Persian sculptures the Lotus is almost as conspicuous, alternating with the Pine-cone as an accompaniment of the most solemn rites. In India, again, we find the same thing—constantly the Lotus occurs, and its sacred character is always apparent. Hindu legends say that Brahma came forth from its blossom, and Sri and other gods are sculptured sitting upon an open flower and holding buds in their hands. Buddha is likewise thus portrayed, and, according to some accounts, first appeared floating on this mystic flower.‡

Perhaps it was the spread of Buddhism which carried the Lotus to China and Japan. But from whatever place it came and at whatever time, it soon grew to be as familiar and beloved as it had been at home. At every step in Japan one finds great tanks filled with the Lotus, and in many religious ceremonials it has its function, while the peculiar grace of its habit and its beauty of form and color in leaf and bud and flower and fruit, added to its religious significance, have made it chief among the artist's models. Countless works of Japanese art are based, palpably or remotely, upon the Lotus, from the delicate lines of the surface-decoration applied to some tiny object or the pattern on a woven stuff, to the great bronze vase in which the living plants are grown. Our illustration on page 175 shows such a vase or tank, which was brought to New York a few years ago by the late Mr. Edward Greey.* Nothing could be more beautiful than its outline, faithfully copied from nature, yet admirably adapted to the chosen purpose; nor could a more splendid piece of decoration be imagined for a public park or the terrace near some stately mansion than such a vase filled—as we now know it could be filled—with the "Sacred Lotus" of the East.

But it is not alone in Japan that the Lotus has conspicuously entered into decorative and instructional art. Its portrayal as a sacred emblem was not the only manner of using it in Egypt. On page 170 will be found a reference to the vital part it played in the development of Egyptian architecture, while in all the decorative work of this country it is the dominant and sometimes almost the only motive employed. The leaf, the bud, the flower and the fruit-pod, all were conventionalized in the most artistic way, and woven into the most graceful and harmonious patterns. The same is true to a lesser degree of Assyria, Persia, India, Phœnicia and Cyprus. Lotus motives are of common occurrence on the Cypriote vases in the Metropolitan Museum. Doubtless the sacred character of the plant had much to do with its universal adoption in art; but must not the artistic instinct have been keen among peoples who first chose so exceptionally beautiful a plant as a sacred emblem, and then adapted it so admirably to the painter's the sculptor's and the architect's use?

The subject of architectural development is too wide and complicated to be here examined. But we may at least briefly say that some writers believe that Lotus-forms, starting from Egypt, vitally influenced in later ages the course of Assyrian and even of Greek architecture. They believe, for example, that the so-called palmettes, rosettes and anthemions of the Greeks were derived not from the Palm-tree but from the Lotus, and that even in the Ionic capital we may see a conventionalized reproduction of its downward curling sepals or petals, with its clustering stamens or petals in the centre.†—Ed.]

* Perrot and Chipiez, *History of Art in Ancient Egypt*, vol. ii., p. 124.

† "It is about the same size," says Pliny, "as the Pear-tree. . . . The fruit is about the size of a Bean. . . . It has branches thickly set with leaves like the Myrtle. . . . In the country where this tree is indigenous the fruit of it is so remarkably sweet and luscious that it has even given its name to a whole territory and to a nation who, by their singular hospitality, have even seduced strangers who have come among them to lose all remembrance of their native country. . . . A wine is also extracted from this fruit very similar to honied wine. . . . Such is the tree that is so-called in Africa, the same name being given to a certain herb," which was probably Melilotus, a leguminous plant, "and to a stalk that grows in Egypt belonging to the marsh plants." This stalk, of course, is the true Lotus.

‡ T. F. Thistleton Dyer, "The Folk-lore of Plants." See also the illustrations in Fergusson's "History of Indian Architecture."

* This picture was prepared for Mr. Greey's pamphlet on *Japanese Bronzes*, and shortly before his death he kindly consented to its reproduction in Garden and Forest.

† See W. H. Goodyear, "The Lotus in Ancient Art," *American Architect and Building News*, February 9th, 1889, *et seq.* These articles are extremely interesting from the point of view of art; but the author has not clearly seen the general difference between the Nelumbium and the Nymphæas. Nor can there be any doubt that the Nelumbium was the true "Sacred Lotus" of Egypt. The witness of all Oriental nations would suffice to prove the fact.

Cultural Department.

Why Seeds Fail to Grow

THIS question is a vital one, and pertinent to this time, when all farmers and gardeners are preparing their soil for planting seeds. We all know that a large proportion of the seeds sown fail to make plants, and for this there are many reasons. In the first place, many seeds sold and sown have lost vitality because of age. It is not an uncommon practice for seedsmen to sell from a given stock until it is used up. No matter how old a dealer's seeds may be, they are liable to become mingled with the new. This is particularly true of what are known as commission, or "box seeds." Many seedsmen endeavor to build up a large business by selling cheap seeds, instead of giving customers seeds perfectly fresh, and of choice selection, so as to remove one cause of failure.

Again, through climatic influences, or some other condition of growth, many seeds are abortive, or have a low vitality, from imperfect development. For instance, nearly all the Sweet Corn grown the last year germinates badly. On an average it will not test more than two-thirds the usual percentage of sound seed. The same is true of many other seeds. These are simply misfortunes, for which neither seedsmen nor planter is in fault.

But, after all, the main cause of failure is the planter himself. He fails to comprehend the needs of newly-sown seeds. His success should be in proportion to the care he has given to the preparation of his ground. But the very fineness to which he reduces its particles adds a new danger to the seed, unless soil and seeds are closely compacted together. Neglect to firm the soil about seeds is the main cause of failure to germinate. Peter Henderson's paper on "The Use of the Feet in

Sowing and Planting" has been of great value to the planter. By following his instructions, loss of seeds, loss of time, loss of crop, and loss of patience can be avoided. The reasons why firming the soil around the seed when planted are so important, can be easily understood. There is stored up in every perfect seed a latent germ, the development of which is conditional upon the presence of proper proportions of warmth, air and moisture. When any seed is put into the ground, and loosely covered with light, dry soil, it is exposed to drying winds which carry away the moisture, while the same circulation of air prevents the persistent warmth which is needed to promote the chemical action needed for germination and growth. It often happens that seeds germinate without making growth afterward. When growth commences it is in two opposite directions, upwards into the atmosphere, and downwards into the earth, the two sources from which plant-food is supplied. It is a mistake to suppose the first root the seed puts forth furnishes the young plant with food; it simply holds the plant in position until the true or feeding roots are formed. The seed itself contains sufficient food for the infant plant, until its true leaves and roots are formed.

The feeding rootlets of any plant are delicate fibres, and their furniture of root-hairs is never seen by the casual observer. Now, when the rootlets are formed, if the soil is not pressed firmly around the main root, the feeders have nothing to hold to or live upon, but dry up and perish in the open spaces between the loose-lying particles of soil. When the earth is closely packed the young rootlets at once find moisture, which contains food, and find support, as well, in the thin crevices through which they feel their way. In thinning out plants where they have come up too thickly in the seed-beds, the feet should always be used in pressing the soil firmly around the plants left.

Deep planting is another cause of the seed's failure to ger-

A Japanese Lotus Vase.

minate or to grow after having started. The importance of more care in this direction cannot be overstated. Observation and experiment made in planting various seeds at different depths show some wonderful results. Take, for instance, Sweet Corn, and in planting several rows, cover from one-half inch in depth to five inches. The first will germinate without a loss of five per cent., while the last will not grow five per cent., and an almost exact ratio will hold between the increased depth and the percentage of failure; at the same time, the vitality of the plants will vary in the same proportion as the germinating properties. The cause for this difference is, that at the season of Corn-planting sufficient warmth is not found much below the surface. Again, Corn planted at a depth of three or more inches will not make as rapid or healthy growth as when covered only half an inch or one inch, because it makes two sets of roots—surface and underground roots—the one being quite as important as the other. The surface roots form at the first joint, just above the kernel, when it is covered to the depth of three inches; this joint is below the surface, and the plant ceases growth until a new or unnatural joint is formed at the surface of the ground, from which these roots proceed. When Corn is planted in mellow ground the hoe should never be used in covering, the feet being the best implement that can be employed for the purpose. When the Corn is dropped, with the foot scrape sufficient earth over it to cover to the depth of half an inch, then step on the hill in such a manner that it will get the whole weight of the body, and the work will be well done. The same rule will apply to the planting of many other seeds. The diameter of a seed is generally the proper depth for its covering when planted.

Mechanical assistance in planting will often help the germination of seeds, and consequently the growth of plants. If seeds of squash and the like are put in the earth endwise and germ down, they will sprout much sooner and with more certainty. It is true, also, of Lima Beans, that when planted edgewise and eye down they come up more quickly and surely.

Pertinent to this time and subject is a word on transplanting, as it shows the importance of firming the soil around the roots of young plants. Last year in Garden and Forest, I gave a few hints on transplanting, taking the ground that the proper time for this work is in pleasant weather rather than a rainy day. I stated then that plants, when removed from the seed-bed into the position they are to occupy, should be puddled in, and that the earth should then be pressed around the roots, after which loose dry earth should be scattered around the plant to prevent evaporation. I never put out plants in any other way, and never lose one; while plants set in a rainy day often fail, unless the rain is very heavy after transplanting, so that by its own force the earth is thoroughly packed around the roots. If plants are taken up when the soil is quite dry it drops from the roots without injury; on the contrary, if wet and heavy it carries away, in parting, many of the fine roots with it, and from this injury the plant is slow to recover.

But a few days since a gardener from Long Island thanked me for the article of last year, saying that he followed the instructions to the letter, put out the plants on a pleasant day without discomfort, and did not lose a single plant, and had the largest and finest crop of cabbage and cauliflowers ever known in that section. His neighbors, who waited for a rain, had only half a crop.

In cases of failure in germination the blame is usually charged upon the seedsman. He is sometimes guilty, but I am convinced that fully ninety per cent. of the failures result from improper methods of sowing and planting.

Garden City, N. Y. *C. L. Allen.*

Palms.

A LITTLE extra care given to this class of plants at this time of the year will be well repaid by a more vigorous growth and greatly increased beauty during the remainder of the season. Cleanliness is absolutely essential to their welfare at all times, but especially now, when careful washing with a sponge will effectually rid the plants of the various insect pests, such as scale in variety, and mealy-bug, so often found upon them. Thrips and red-spider, though capable of doing much injury to the foliage, are not often found in quantity when the plants are syringed regularly and thoroughly. By giving this work proper attention now, much labor will be saved later in the season and finer plants secured. There is a difference of opinion as to the best wash to use. Many growers consider "Fir-tree Oil" the most efficacious, but although this is undoubtedly good, it will be found more expensive and also more likely to injure the tender young foliage than a solution of whale-oil soap. The kerosene emulsion has also been tested for this purpose, but needs careful preparation, and its use is also attended with some danger when the mixture is allowed to remain on the foliage for any great length of time. A similar objection holds against the use of a carbolic acid solution, although it has proved most effective in some cases. If not already re-potted, this work should be attended to at once, since active root-growth has commenced, and if the plants are allowed to become very much pot-bound the foliage will soon lose color and become more or less stunted.

Clean pots should always be used, and they should be well-drained with potsherds, cinders, charcoal or some similar substance, because a majority of Palms luxuriate in an abundance of water at the root as well as overhead during the growing season. If any plant should be found with unhealthy roots, the old soil should be shaken out or washed off the roots, and the plant should then be re-potted in as small a pot as possible, care being taken to work the new soil firmly in among the roots. Where a rapid growth is desired, it will be found best to make the compost rather light, by the admixture of about one part of peat to two of loam, and some good sharp sand, with the addition of one-sixth of the mass of short, well-rotted stable manure. If the space at hand is somewhat limited, it may be advisable to merely top-dress some of the larger plants, or to shift into a heavier soil than the above mixture, so that the plant will be kept in healthy condition without being encouraged to rapid growth. It will also be found necessary to give a light shading on the Palm-house quite early in the season; at least on the side exposed to the afternoon sun, otherwise the foliage of some of the more tender varieties may suffer, but it is well to avoid over-shading, particularly where some of the plants are used for house decoration, as the leaves become too delicate for this purpose, and consequently are soon disfigured.

As to general treatment, it may be added that Palms should never be allowed to become very dry, and during the growing season should be watered very freely, many of the stronger-growing sorts being benefitted by a good watering with liquid manure occasionally. This treatment, combined with a moist atmosphere, plenty of fresh air, and a temperature of sixty to sixty-five degrees at night, includes the most essential points of culture for those in general use, but is not intended to apply to all species without any qualification, as some of the delicate sorts require a special treatment.

Holmesburg, Pa. *W. H. Taplin.*

Orchard Notes.

North and South Slopes.—There is a wide difference of opinion as to the best aspect for fruit. Some contend for northern slopes, some for southern, and both are right. The decision turns upon locality and varieties of fruit. Near large bodies of water late spring frosts seldom do damage. Spring comes on more gradually, evenly, and plants do not start so early. In such localities southern slopes are usually preferable. But away from such bodies of water spring temperatures are commonly more fluctuating, and plants start relatively earlier. Here northern slopes are usually best, as blossoming is retarded. This is particularly the case with early blooming varieties. I often hear people remark that in certain years the only peaches they had were on trees standing on the north side of a building. The reason is that these trees had blossomed late and had escaped late frosts. In many localities late frosts are more to be dreaded than severe winters, and the only successful practice comes from close study of one's individual conditions.

Atmospheric Drainage.—Cultivators usually overlook the fact that with many crops atmospheric drainage is fully as important as drainage of the earth. Cold air is heavier than warm air, and settles in the hollows. The chief reason why hills and slopes are better for fruit is because the cold air drains off. Hedge-like wind-breaks and natural barriers often obstruct atmospheric drainage, and late spring frosts and early fall frosts are the result. I have known a hollow to be drained of cold air, by a channel cut through a bank, with remarkable results.

Grafting Cherries.—A current horticultural journal says that Cherry-trees are very difficult to graft. I have never found them so. The buds swell early, and the grafting must be done very early, otherwise there is no difficulty. Cherry-tops can be changed as readily as Apple-tops. I often hear it remarked that stone fruits cannot be grafted, but the remark has no foundation. Did not Thomas Andrew Knight give us the practice of root-grafting as the result of experiments upon stone fruits?

Too Few Varieties.—It is good counsel that advises growers to set but few varieties, but the advice and practice may be carried too far. The number and kind of varieties must depend upon conditions, largely conditions of market. It is not good practice to set a variety simply because every one else does. Markets often demand a variety of products. Tastes change. Many apple-growers in western New York would have been glad of something besides Baldwins last fall. Plan a succession. Plan for various available markets, and a variety of ways of disposing of the crop. This usually demands more than one or two varieties. *L. H. Bailey.*

Cornell University.

Notes from the Arnold Arboretum.

THE season here is a very early one, at least twelve or fifteen days earlier than the average, and fully twenty days earlier than that of last year. There is hardly any frost in the ground, except in deeply-shaded situations, although it is unusually full of water. Broad-leaved evergreens and conifers, without exception, look unusually fresh and well; of deciduous plants it is still too early to speak with much confidence, as they rarely show the ravages of winter, until it is time for the leaf-buds to begin to swell.

The earliest shrub in flower (it has been in bloom for fully two weeks, and is still fresh) is the Japanese Witch Hazel (*Hamamelis Japonica*). As it now appears, covered with its bright canary-colored flowers, it is a cheerful and pleasing object, which may well find a place near the window of every northern home for this early cheerfulness, which does not succumb to hard freezing or to the inevitable spring snow-storm of New England. The Japanese species is very closely allied to our familiar American Witch Hazel, although the leaves are somewhat narrower, more inclined to be slightly lobed, of rather different texture and of a duller green. The flowers are produced in very early spring, instead of in late autumn, and the petals are narrower and perhaps brighter colored. In the flower on the Arboretum plant the calyx is yellow; but that it is sometimes purple or red appears from the figure of this species (*t.* 6,659) published in a recent volume of the *Botanical Magazine*. But this evidently is not a constant character, and was not considered by *Franchet & Savatier*, who discussed the differences between this and the American species (*Enum. pl. Jap.* ii., 368). They found the best distinction in the number of the principal veins of the leaf; a character which does not, however, at all hold in our cultivated plants. The time of flowering very well separates the two species, however, for any garden purpose, at least; while the differences in habit and in the general appearance of the leaves are equally well defined and constant. *Hamamelis Japonica* becomes in its native country a small tree. It was introduced into Europe and thence to the United States by the Veitches. A third species (*H. mollis*, Hooker's *Icones Plantarum*, *t.* 1741) is one of the new discoveries in central China.

Erica carnea is beautifully in bloom, and so are the native and some of the foreign Alders. These were closely followed by several foreign species and varieties of Hazel, most of which bloom ten or fifteen days earlier than our native species. The two earliest (probably merely forms of the same species) are two north China and Manchurian plants, cultivated here under the name of *Corylus Manchurica* and *C. heterophylla*. They form neat, compact bushes, three feet high, with ashy-gray branches and handsome foliage, which turns brilliantly in the autumn. They now bear male and female flowers abundantly, so that there is a prospect for fruit, which has not yet been produced here. These are plants to be better known and more often seen in gardens, although, of course, they will never be favorites with people who only value shrubs for their showy flowers.

It is interesting, now that the winter is over, to look through the collection and see what plants have retained their fruit bright and fresh up to this time, and which are, therefore, the most desirable for the winter decoration of shrubberies. The list is not a very long one; six weeks ago it could easily have been made much longer, for it is the rains and the warm suns of February and March which cause the fruits of many plants to become discolored from decay. The fruit of *Berberis Thunbergii* is perhaps in the best condition of any in the collection. It is as bright and nearly as abundant as it was in November, and has not shrivelled perceptibly. The fruit has disappeared almost entirely from all the other species of Berberis. The scarlet fruit of *Viburnum Opulus* (the Cranberry-tree) is still hanging on the plants in considerable profusion, not having been devoured this year by birds, as is generally the case. The fruit shows the effects of hard freezing, but is almost as bright in color as it was in the autumn. And this is true of the fruit of the Black Alder (*Ilex verticillata*), which birds do not seem to relish and which is still very abundant and fresh, making the plants conspicuous and beautiful objects. Many Roses a month ago were still covered with brilliant-colored hips, but these have now turned black on nearly all the species, native as well as foreign. The most conspicuous exception, however, is our common Swamp Rose (*Rosa Caroliniana*), which is loaded still with highly-colored fruit, and *Rosa repens*, with its slender, pear-shaped maroon hips. The fruit of *Rosa nitida* is still presentable, although less so than that of either of the species just named. Scarlet and red fruits seem to keep better, on the whole, than black ones (although, no doubt, the coincidence is quite accidental), but the exception is *Ligustrum vulgare*, whose jet black berries are as abundant and deeply colored now as at any time during the year. Birds, apparently, have nothing to do with them. The black fruit of *Cornus sanguinea* is still abundant upon the plants and fairly well colored, although losing fast its freshness. Of other black fruits there is hardly a trace left in the collection.

Among plants here which are conspicuous in winter on account of the highly colored bark covering their stems and branches, by far the handsomest and most desirable in every way is that variety of *Cornus alba*, sometimes known in nurseries of *C. Sibirica*. It is evidently a variety of the widely-distributed *C. alba*, but what its origin or history is I have not been able to discover. The bark is bright red, much brighter than that of *C. alba*, or of any other species of Cornus—a genus which furnishes some of the brightest objects which can be used for the decoration of winter gardens or shrubberies.

March 29th. *J.*

Principles of Physiological Botany, as Applied to Horticulture and Forestry.

XV.—Seed-breeding.

AS we have already seen, a plant, for instance an Elm, is a community of individuals, and it possesses such a degree of unity between all the component parts, that in popular language we speak of it as an individual. This term "individual" can be used also in scientific language with convenience, and hence it is frequently customary to speak of a given elm, rose or phlox as an individual. When, now, we compare all the elms with all the roses and all the phloxes, we see at once that we are dealing with widely-separated kinds of individuals. These kinds are known as *genera*.

If, next, we restrict our observation to all the elms we know, we are struck at once by the existence of certain differences which render it necessary for us to divide the genus elm into minor groups, such as the Slippery-elm, the American Elm, the English Elm and the like. In the same manner we classify the roses into such groups as the Sweet-brier, the Dog-rose, the Prairie-rose, and so on. The phlox genus readily breaks up into such groups as Drummond Phlox, Panicled Phlox, Spotted Phlox, etc. These minor groups, into which the genus is divided, are known as *species*.

But these species comprise innumerable individuals which differ from each other in some particulars. For example, Drummond's Phlox is a species containing countless forms which differ from each other in the matters of color, height and smoothness. These divergent forms within the limits of the species are known as *varieties*.

It was formerly held by botanists that between varieties and species there exist absolute distinctions, but, of late years, the view has been gaining ground that species and varieties may grade into another. Between certain species there are numerous intermediate forms which conceal any line of demarcation. There are wide differences between the degrees of likeness and unlikeness presented by varieties; some varieties are almost like the general average of the forms which make up the species, while others are very different indeed.

There is another very marked difference between certain varieties: some of them can be perpetuated by seeds, while others cannot. The latter vary from the parent plant in many particulars, while the former come, as we say, "true to seed." Varieties which come true, or reasonably true, to seed are termed *races*. If, therefore, we have a choice race of plants, we can, with a fair degree of success, propagate it by means of seeds, and year after year we shall have substantially the same results. If, however, our choice form of plant is only a mere variety, we are compelled to propagate it by means of cuttings or by the transfer of buds in some way. In this manner we perpetuate desirable varieties of apples, pears and roses: by grafting or budding, by layering or by cuttings, as experience

has shown to be the best adapted to the particular case, the special features of the variety are kept with very little, if indeed any, change.

The question is still a mooted one, whether such choice varieties do not after a time wear out? The late Professor Gray was inclined to think that there are differences in this respect; some varieties appearing to lose a part of their distinctive characters, while others seem to maintain them with no loss whatever.

The close observer can, by careful selection of the seeds of the varieties of the plants which he has under cultivation, intensify nearly any given peculiarity which he wishes to keep. In other words, by selection of the forms which he thinks desirable, and using in successive seasons the seeds of those varieties only which he wishes to preserve, he can, within certain limits, direct the development of the variation. But there are two very important precautions which must be observed: (1) The pistils of all the flowers on the plants of the desirable variety must be fertilized by the pollen from flowers of the same plant, and (2) no pollen from other plants must be permitted to act on them. By this close-breeding variations can be led along up to a certain point, not always the same for all varieties, but in most cases where care is taken, the divergence from the ancestral type can be made very pronounced. It frequently happens that after several generations of this close-breeding the variety acquires the power of taking care of itself and can then come true to seed.

Now, as a matter of fact, this continuous close-breeding seldom, if indeed ever, occurs in a state of nature. There are a few plants which do not produce seeds to any extent; for instance, the common Horse-radish, the Banana, the Pine-apple and so on, but these have so long been under cultivation by bud-propagation that the formation of seeds has ceased or, at least, very rarely occurs. But when any variety of plant produces seeds, there is some provision for an occasional break in what might otherwise be uninterrupted close-breeding. As a result of this interruption, the varieties are crossed with others, which serve to check too great specialization. The gross result, then, of all the cross-breeding within the limits of the species is that the average is kept well up to the type of the species.

The varieties which we should cultivate if we had our own way are by no means those which are adapted to cope with their surroundings, in fact, their very specialization may wholly unfit them for success in the struggle for existence. In a state of nature, the varieties which we might regard as desirable to keep for our own wants are very likely to disappear after two or three generations by simply dropping out of a contest for which they are unfitted. In the majority of cases they are merged by cross-breeding with other varieties, and are thus brought up to the type of the species which, from the nature of the case, represents the form which is best suited to meet all the exigencies of the surroundings.

In nature, the cross-breeding between varieties of the same species is effected by the agency of the wind, insects, etc., which may carry the pollen of one variety to the pistil of another. The contrivances* for this purpose are among the most wonderful and complicated in organic nature. A comparison between the results of continuous close-breeding and cross-breeding can be made experimentally. Careful experiment must, for honest thinkers, outweigh all speculation and previous conceptions. Such experiments have been conducted by Mr. Darwin in the case of the common plant, Morning-glory, and the results can be readily seen in the following account:†

"The plants experimented upon in all cases were raised from carefully-ripened seed, and when ready to flower were placed under nets with meshes one-tenth of an inch in diameter, in order that all pollen-carrying insects might be excluded.

"A plant of *Ipomœa purpurea* (Morning-glory), growing in the green-house, was protected in the manner just described, after ten of its flowers had been fertilized by pollen from their own stamens, and ten others by pollen from a distinct plant of the same species. The seeds from the first ten flowers may be termed *self-fertilized*, those from the other ten, *crossed*. The two kinds of seed were placed on damp sand on opposite sides of a glass tumbler covered by a glass plate, with a partition between the seeds, and the glass was put in a warm place. As often as a pair of seeds germinated they were put on opposite sides of a pot, with a superficial partition between them, and the same procedure was followed until five or more seedlings of exactly the same age were planted on the opposite sides of several pots. The soil in the pots in which the plants grew was well mixed, and the plants on the two sides were always watered at the same time; thus the seedlings were subjected to practically the same conditions from a very early stage.

"In the same manner, self-fertilized and crossed seeds were secured during ten generations. The results, so far as these can be shown by measurement of the plants, are exhibited in the following table:

IPOMŒA PURPUREA.

Number of the generation.	Number of crossed plants.	Average height of crossed plants in inches.	Number of self-fertilized plants.	Average height of self-fertilized plants in inches.	Ratio between average heights of crossed and self-fertilized plants.
First.....	6	86.	6	65.66	100:76
Second...	6	84.16	6	66.33	100:79
Third	6	77.41	6	52.83	100:68
Fourth...	7	69.78	7	60.14	100:86
Fifth.....	6	82.54	6	62.33	100:75
Sixth.....	6	87.50	6	63.16	100:72
Seventh..	9	83.94	9	68.25	100:81
Eighth....	8	113.25	8	96.65	100:85
Ninth	14	81.39	14	64.07	100:79
Tenth....	5	93.70	5	50.40	100:54
All ten generations taken together.	73	85.84	73	66.02	100:77

The results of close and cross-fertilization, as shown by the weight of the seed-capsules, are given by Darwin thus: "The offspring of inter-crossed plants of the ninth generation, crossed by a fresh stock, compared with plants of the same stock inter-crossed during ten generations, both sets of plants left uncovered and naturally fertilized, produced capsules by weight as 100 to 51."

Similar experiments by Darwin upon other plants confirmed his experiments related above, and show conclusively the advantage which plants derive from occasional inter-crossing. But the manner in which this advantage to the species may counteract the work of the cultivator, in his improvement of special varieties, appears in its clearest light when we recall what has been said in regard to the diverse directions which variation may take. We can, by constant care, preserve the variations which we choose, but Nature keeps, in the long run, only those which are fitted for the surroundings.

Cambridge, Mass. *George Lincoln Goodale.*

* See Gray's Text-Book, Vol. I., Cross-fertilization.

† Gray's Text-Book, Vol. II., page 448.

Correspondence.

The Mutilation of Conifers.

To the Editor of Garden and Forest:

Sir.—About 600 feet from my house is a clump of Norway Spruces, some fifty feet high, of vigorous growth and in perfect health. During the winter and early spring months the ground under these Spruce is invariably covered with tips and branches from two to twelve inches long. For some years I attributed to squirrels the cutting of these branches, although I have never seen a squirrel on or near the trees. This clump of Spruces is the winter home of several pairs of blue jays, whose screams and noisy demonstrations enliven our neighborhood throughout the year. My present belief is that the jay is responsible for the broken tips in this instance. This opinion has been strengthened by the reading of Mrs. Olive Thorne Miller's charming little book, "In Nesting Time." Mrs. Miller's patient investigations and her acute observations of the habits of some of our every-day birds are exceedingly valuable. Her account of the eccentric behavior of a pair of blue jays which she sheltered and watched during one winter may help elucidate the present discussion. If your well-informed correspondents who have so admirably discussed the mutilation of Conifers will read pp. 176 to 203 in Mrs. Miller's work they will doubtless conclude that, if the jay be guiltless of the offense now charged, it is assuredly not from inability on the part of the jay. Should this bird prove to be the culprit, it is to be hoped that horticulturists will spare the jay on account of his many valuable qualities, his beauty and his cheerfulness. *J. R. Leeson.*

Boston.

Editor of GARDEN AND FOREST:

Sir.—I was glad to see your recent article entitled "How Trees Grow Tall," reproducing Professor Gray's clear explanation, for I had long wondered how so many people, familiar from their youth up with growing trees, could so constantly misunderstand their method of development. Here is another instance of almost incredible mis-statement which I clip from a little article recently published in the New York *Sun*, describing "Queer Trees" in Connecticut. "In Westfield," we were told, "a boulder weighing over half a ton is to be seen about ten feet from the ground, in the crotch of an enormous Apple-tree, and old residents say that they can remember when that boulder could be sat upon, so near to the ground was it when they were young." Perhaps the correspondent of the *Sun* did not believe the fable he reported, but undoubtedly the "old residents" had no idea they were telling an impossible yarn.

New Haven, Conn. *R. H. K.*

Periodical Literature.

The larger part of *Bulletin* No. 8 of the Botanical Division of the Department of Agriculture, recently issued, is devoted to notes upon grasses and related subjects, from the pen of Dr. Vasey. Most interesting to the general reader will be his description of the new grass experiment-station, lately established in Kansas by the Department under authority from Congress. The aims of the Department and the actual condition of these experiments are best made known in Dr. Vasey's own words:

"For several years past the Department of Agriculture has been making special investigation of the grasses of the West, particularly those of the arid districts, with a view of ascertaining what are the prevailing or prominent species, what is their range of distribution as to locality and soil, what their value for grazing purposes, and what kinds offer a reasonable prospect of being valuable for cultivation. Great interest has been felt in this subject both by farmers and cattlemen, and government aid has been invoked for the purpose of conducting suitable experiments, and such aid has been strongly recommended by the Commissioner of Agriculture.

"In response to these requests, Congress, a few months ago, made a moderate appropriation for the purpose of establishing grass experiment-stations. It was determined that one of these stations should be located west of the one-hundredth meridian. After careful investigation a location was selected at Garden City, in south-western Kansas, where a public-spirited citizen made a free lease to the government, for five years, of 160 acres of land on the high prairie two miles north of the city. This is so located that irrigation can be employed on such portion of the land as may be desirable. The chief object of the station is to experiment with grasses and forage plants, both native and foreign—with any kinds, in fact, which give promise of utility and adaptation to the climatic conditions of the arid plains, and furnish a substitute for the scanty pasturage now existing. This is a great necessity. In order to secure the permanent settlement of this portion of the country, it should be ascertained what can be depended upon in the occupation and cultivation of the dry uplands where irrigation cannot be applied. It is a vital question, affecting the interests of thousands of settlers over a great extent of country.

"Upon the location of the station the Commissioner appointed Professor J. A. Sewall, of Denver, as Superintendent of the station, and he has up to the present time had eighty acres fenced, forty acres plowed, a quantity of grass-sods transplanted into prepared ground; has put a small seed-house, and made everything in readiness for more extensive work next spring. The results of the experiments will be watched with great interest; but definite results cannot be expected without the allowance of a considerable period of time.

"The need of some grasses suitable to the climate of the dry region lying mainly west of the one-hundredth meridian has been long felt and acknowledged. It is estimated that there are in eastern Colorado, western Kansas, western Nebraska and southern Wyoming 120,000 square miles, or over 76,000,000 acres, of this arid, elevated country. This region was known to be covered principally by short grasses, called 'Buffalo' and 'Mesquit,' in some places thickly covered, in others more and more sparsely, while in some portions the amount of grass was exceedingly small. During the greater part of the last twenty-five years this region has been occupied for cattle and sheep ranches, for which purpose alone it was thought to be adapted. But even for this purpose its ability to support the domestic grazing animals was very small compared with its vast extent. This arises partly from the fact that only such portions as were within reasonable distance from water could be utilized, and partly from the scanty supply of grass. The estimates as to the supporting capacity of these plains vary much according to localities, some statements being that forty to fifty acres are required to support one animal, others that twenty or thirty acres are sufficient, and yet others that ten to fifteen acres are enough.

"Sufficient time has not yet elapsed to determine what will be the ultimate success of general agriculture in this section, but there can be no doubt that the country is eminently adapted to pastoral uses, and the settlers would do well to bestow their attention largely on stock-raising and dairying. But it is evident that in order to make this business profitable for small farmers or men of limited acres, some means must be devised for an increased production of grass upon the land. This is the present most important problem for the arid districts. It is asserted that the commonly cultivated grasses will not be successful in these arid lands, except where irrigation can be applied. The native grasses of the region, which are mostly 'Buffalo grass' and 'Grama grass,' are acknowledged to be very nutritious, but the yield is so light as to require a large area for cattle to range over to obtain support. The inquiry naturally occurs, 'Cannot some grasses be obtained which will not only endure the aridity of the climate, but also make a more vigorous growth and a more abundant production?'

"It may safely be laid down as a principle that no great improvement in this respect can be expected without a cultivation of the soil. With this even the Buffalo and Grama grasses may be expected to double their production."

The second part of the Bulletin is devoted to vegetable pathology, and includes a number of papers prepared by Dr. B. T. Galloway, including essays upon the "Potato Scab," on the "Foot-rot of the Orange," upon "Parasitic Fungi in Missouri," etc. These are all papers of interest and value.

Exhibitions.

The Flower Show at Philadelphia.

THE Spring Exhibition of the Pennsylvania Horticultural Society, which was held last week, was probably equal in merit to the very best that have preceded it. It would have been still more attractive if the tables had been covered with moss or green cloth and if the broad zones of buff wrapping-paper, nailed about the stages to hide the trestles, had been replaced by a neat curtain of some more suitable color. From some points of view the obtrusive presence of the paper defeated well-meant attempts at an effective grouping of the plants, but the mass of foliage upon one side of the stage was most impressive. The plants in this group were from the famous gardens of Miss Baldwin, and her gardener, Wm. Joyce, deserves especial credit, inasmuch as the houses where the plants were grown are situated in the very heart of the city of Philadelphia. A superb *Kentia Forsteriana* had the place of honor, and it was supported by other rare Palms with noble Dracænas, Ferns and the like. Among the noteworthy specimens here placed were an immense variegated Pandanus, furnished to the ground, and a large *Cocos Weddelliana*, in fruit, and yet as green and perfect from bottom to top as a thrifty young plant two feet high.

No better Hyacinths were ever seen here than those shown by Wm. Jamison, gardener to Mr. R. S. Mason, and they were well worthy of the gold medal offered by "the General Union of Holland for the promotion of the cultivation of Bulbs." The same exhibitor also received the medal for Tulips. In Orchids, the exhibition was unusually strong. The first prize went to Messrs. Pitcher and Manda, of Short Hills, New Jersey, and so did the first prize for cut Orchid-blooms. Among the interesting plants of this collection was a *Cypripedium Boxali atratum magnificum*, *C. barbatum biflorum*, *Odontoglossum Andersonianum* and a fine specimen of *O. luteo-purpureum* with extraordinary spikes of bloom. The collection of Siebrecht & Wadley, which gained the second prize, contained the rare *Aganlina cyanea*; and the collection of Mr. Charles Dissel, which won the third prize, showed, among many other treasures, one of the largest plants of *Dendrobium nobile* ever grown. It probably bore 500 flowers. Near these Orchids were many fine specimen plants trained by David Emery, Mr. Dissel's gardener, among them a conical Azalea, Roi d'Holland, covered with flowers, and a finely-grown Fuchsia. Other attractive features of the show were a group of twelve Ferns, by Thomas Long, gardener to Mr. A. J. Drexel, and some wonderful Cinerarias by the same exhibitor.

But, after all, the interest of the exhibition centred in the cut Roses, which were shown in abundance and of the very highest quality. General Jacqueminot, Captain Christy, American

Beauty, Baroness Rothschild, The Bride, La France and Papa Gontier were all seen at their very best. But since pink Roses are in such exceptional demand this year the great rivalry was between the two leading varieties of this color, and it would be difficult, and perhaps impossible, to find specimens of Mrs. John Laing to excel those grown by Evans & Battles or of Madame Gabriel Luizet superior to those grown by Edwin Lonsdale.

Notes.

Among the fine specimen plants in the Drayton Garden is a Pittosporum, ten feet high and thirty feet in diameter.

The Grape Hyacinth (*Muscari botryoides*), grown in pots and arranged with Lily-of-the-Valley, makes a beautiful combination.

Forty-six Japanese gardeners are now employed, it is said, in California, where it appears that the taste for Japanese fruit and ornamental trees has greatly increased.

Dr. Charles Mohr, of Mobile, and Professor Eugene A. Smith, the state geologist of Alabama, have united in presenting their herbaria of Alabama plants to the University of that state. Dr. Mohr is at present engaged in catalogueing and arranging the collection.

Mr. Edward L. Davis, of Worcester, Massachusetts, to whom his native city is indebted for the generous gift of the land for its new park system, now proposes to build, at his own expense, upon the highest summit of Lake Park, a massive and stately stone observation tower, as a further gift to the people of Worcester.

The latest atrocity in the way of "fashionable" floral arrangements is a muff composed of flowers, for the use of bridesmaids at weddings. People seem slow to learn that there is a right way and a wrong way to use natural flowers, and that all ways are wrong that force them to simulate the form of some article of dress or ornament!

Nos. 165 to 169 of the Journal of the Linnean Society, being the first half of Volume XXV., are devoted to a list of plants of Kohima and Muneypore, collected in 1885 on a march from Galaghat, in central Assam, to Cachar, with descriptions of new species by Mr. C. B. Clarke. This important paper is illustrated with forty-four plants.

We have received the early numbers of a new monthly journal of horticulture—*L'Horticulteur*—published at Mons, under the auspices of the horticultural society of the district. Judged by these early numbers, the new journal is chiefly cultural in scope. M. Wesmael, the accomplished Belgian dendrologist, appears among the list of contributors.

The Duc de la Rochefoucauld has presented to the Agricultural Society of France the sum of $20,000, the interest of which is to be given as a bounty to the author of an agricultural almanac, which must contain, in addition to the theoretical principles, a summary of the leading experiments in agriculture made during the year. A condition of the gift is that it, the book, shall be sold for five cents.

The people of California are to be congratulated upon Professor Hilgard's decision to refuse the position of Assistant Commissioner of Agriculture, offered to him by the President, and to remain the Director of the California experiment station, where he can accomplish infinitely more than he could do in Washington, under the demoralizing political influences which beset the Department of Agriculture.

Mr. E. W. Reasoner, of Manatee, Florida, writes to the Agriculturist of that state that a seedling variety of the Southern Dewberry (*Rubus trivialis*), which was found growing originally among grass and rubbish in a rich part of an old cornfield, has proved very productive of delicious fruit, better in flavor than any Blackberry. This Dewberry ripens in Florida about the middle of April, and bears for three weeks. Mr. Reasoner considers it more profitable than the Strawberry, in his section of the state.

It is believed in California that the discovery of the fuel value of Peach and Apricot-stones will largely increase the dried-fruit industry in that part of the country. Peach-stones are said to make as good fuel for domestic purposes as the best coal sold in California. The present price is $6 a ton; Apricot-stones do not burn as well, and sell at correspondingly lower rates. The great piles of stones seen in the neighborhood of fruit-drying establishments are gradually being sent to San Francisco, and the profits of California fruit-growing are greater than ever.

The pest of ground squirrels has become so great in California that the farmers in some counties are organizing against them. It is proposed to pay a bounty, raised by local taxation of so much per acre, to every owner of land who shall keep it free of squirrels; and to appoint squirrel inspectors, whose duty it shall be to destroy the squirrels when the owners of the land neglect to do so, and who shall be paid for their services by the community. A bounty of fifteen cents an acre is suggested for the most seriously infested lands.

The *Manufacturer and Builder* gives some interesting statistics of the manufacture of tooth-picks in a factory at Harbor Springs, Michigan, which is said to be one of the largest of its kind in the United States. The wood of the Canoe Birch is used exclusively. The logs are sawed into pieces twenty-eight inches long, which are thoroughly steamed and then cut into veneer. The veneer is cut into long ribbons three inches in width, and these ribbons, eight or ten of them at a time, are run through the tooth-pick machinery, coming out at the other end, the perfect pieces falling into one basket, the broken pieces and the refuse falling into another. The picks are packed into boxes, 1,500 in a box, by girls, mostly comely-looking young squaws, and are then packed into cases and finally into big boxes, ready for shipment to all parts of the world. The White Birch tooth-picks are very neat and clean in appearance, sweet to the taste, and there is a wide market for them. The goods sell at the factory at $1.90 a case of 150,000 picks, or 100 small boxes each containing 1,500, and the small boxes retail at five cents each, or 300 picks for a cent. This single mill produces about seven and a half million tooth-picks each working day.

We are indebted to Mr. John Harshberger, of Philadelphia, for flowers of *Eranthis hyemalis*, gathered in Bartram's Garden, where it has been growing for fifty years, at least, having become naturalized, and is now the first plant to bloom in the spring. Mr. Harshberger suggests "that this would be a good plant to set out in groups under trees in any lawn or garden, where, if once established, it would grow without care. The flowers appear earlier than those of the Crocus, the Daffodil or the Tulip, and their yellow color makes a very pretty showing. The plant seems to follow the habits of some of its sister Alpine plants, flowering almost before the snow is off the ground." *Eranthis hyemalis*, or, as it is popularly known, "Winter Aconite," from a resemblance of its leaves to those of the true Aconite, is a member of the Ranunculus family, and closely related to the Hellebores. It is a dwarf, perennial plant, two or three inches high, with fleshy roots, bright green, deeply divided leaves and bright yellow flowers an inch across. It is a native of western Europe, and for three hundred years has been a favorite in gardens, being one of the very earliest plants to open its flowers. There is a second species, *E. Sibiricus*, which is much less commonly seen in cultivation.

Several correspondents of the *Garden* (London) have protested of late against the use of cotton as a packing for fresh flowers and fruits. One, who signs with the initials of a well-known horticulturist—Mr. F. W. Burbidge—says: "Nearly every day examples come before us of the misuse of this material. As a packing material for cut flowers or living plants, cuttings, scions, etc., it is the very worst if employed in immediate contact with vegetable tissues. I saw some young plants of the rare pink-flowered Banksian Rose the other day which had been swathed up in dry cotton-wool, and the stems were blackened as if by fire wherever it had touched them. Flowers packed with this wool around them arrive limp and drooping, and over and over again have we seen Peaches with all their freshness and beauty destroyed by this substance. If fruits are wrapped up each separately in tissue paper, the wool may then be used with advantage as a soft padding, but if it comes into immediate contact with either flowers or fruit, they are always more or less damaged by it. The rule to observe in using cotton-wool is to wrap everything in paper before using it. It is most useful in packing fruits if this rule be observed, but for flowers and living plants and cuttings of all kinds, fresh, clean, wood Moss is infinitely better in all ways. We have received boxes of flowers packed in living Moss, and have admired the packing almost as much as the flowers themselves. Of course, very delicate white blossoms should also be wrapped in tissue paper before the Moss is placed near them, but as used in any way there is no better and safer packing material for flowers and plants than the fresh Hypnum Moss of our woods, and there is really no comparison between it and cotton-wool.